ALLIANCE TO SAVE ENERGY
Creating an Energy-Efficient World

Energy Productivity is the Best Medicine:
Corporate Energy Management at Merck & Co., Inc.
A Corporate Energy Management Case Study
Sponsored by the U.S. Department of Energy, Industrial Technologies Program

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OVERVIEW

Corporate energy management (CEM) at Merck is a derivative of the company's strategy to improve key processes to increase speed, flexibility, and efficiency to reach new performance levels. Merck seeks to reduce energy consumption primarily by minimizing capital investment on utility infrastructure and implementing energy best practices on all new projects. A corporate energy program is mobilized by goals that hold facility managers accountable for annual performance targets. Energy costs at manufacturing facilities are on a growth-adjusted pace to be cut 25 percent between 2000-2005. This equates to at least 250,000 tons of avoided carbon emissions and 21.3 percent energy expenditure savings.

FACTS & FIGURES:

Merck & Co., Inc. is a global research-driven pharmaceutical products company. Merck discovers, develops, manufactures and markets a broad range of innovative products to improve human and animal health, directly and through joint ventures.

Revenues: $22.5 billion in 2003

Scope of operations: 48 facilities worldwide.

Direct Energy Costs: $178 million projected for North American facilities in 2004. Costs do not include staff, with the exception of one full-time Energy Manager for North America.

Key energy professional: Keith Williams, Senior Manufacturing Head and Energy Manager for North America.

Quote: "Merck is committed to the efficient and responsible use of energy in its global operations …. In addition, the Company actively pursues strategic initiatives to improve energy efficiency by establishing and implementing effective energy management programs worldwide." -- Merck website

What was the desired outcome of the corporate energy management (CEM) effort?

Merck wanted to reconcile production growth with a need to minimize capital expenditures. Existing steam systems and other utilities were re-evaluated for capacity improvements that reduced waste while boosting productivity. In addition, plant managers were charged with achieving two percent annual reductions of energy costs over a five-year plan (2000-2004).

What were the issues (or symptoms) that led to the implementation of CEM?

In 2000, the Company was undergoing unprecedented growth. To keep pace with demand, new research and production capacity was being added at many of Merck's operations around the world. That growth had the potential to result in significant capital investments to cover the new energy requirements. The initial focus was on the Company's two largest manufacturing facilities - Rahway, NJ and West Point, PA, and has now grown to include 48 of Merck's operations worldwide.

What were the technical, managerial and behavioral elements developed?

A Core Team was convened to form the nucleus of a larger team, the Merck Energy Reduction Initiative Team (MERIT), which coordinates the Global Energy Management Program (GEMP) at Merck locations worldwide. The Core Team meets monthly to oversee the implementation of the program and provide guidance to the facilities representatives, who ultimately carry out the 4-point strategy. When additional expertise is required, the Core Team can also call upon a network of individuals that make up an Expanded Team.

The 4-point strategy consists of: a strategic plan, annual reports, best practices, and awareness. Additionally, the facilities representatives can call upon the resources of a number of sub-committees, including: administration, auditing, benchmarking, best practices, communications, engineering, finance, new technology, procurement, and water.

How are empowerment and accountability addressed?

The Energy Team sets an annual energy savings goal that the company aims to achieve. The facilities representatives implement the 4-point program, which includes the development of an individual facility strategy. The facility representatives identify the goals and priorities, and any new capital improvements or retrofits. They identify conservation projects, develop schedules and milestones, and submit projects for capital funding annually. The data is normalized to reconcile against the profit plan, which is ultimately bundled and submitted to the Senior Vice President of Manufacturing. Energy Savings is an item on the Manufacturing Division's performance grid.

What were the barriers to implementation, and how were they overcome?
An initial barrier many of the individual facilities faced was a lack of capital and a general inertia toward trying something "new." Therefore, initial improvements had to be low or no cost. Additionally complicating things was insufficient staff time to perform energy improvements, which were seen as outside of their normal job functions. Merck responded initially at one facility by bringing in energy reduction consultants to seek out low cost savings opportunities that could be easily implemented. Once the facility was able to realize the benefits, it opened the door for the Global Energy Management Process implementation to pave a pathway for all of the facilities to gain the funds needed for other energy-related projects. Systematically employing the program throughout the different divisions of the company allows for continuity and expanded opportunities. Every project from its inception refers to Merck's Best Practices Team, which maintains an intranet archive of proven energy solutions and procedures, and how-to checklists. Complimenting that group is the New Technology group that evaluates emerging hardware and techniques for potential adoption. Topping off the list is a communications team that keeps facility staff apprised of new developments and opportunities.

How are results monitored, communicated and replicated across plants?
An Administration Team keeps a rolling tabulation of corporate-wide energy savings. The results are published for senior management each quarter. A spreadsheet presents one tab of data for each division. Individual facilities are line items under each tab. Data includes energy volumes consumed, gross savings (attributable to facilities that are designed to be energy-efficient from the ground-up), and non-gross savings (attributable to retrofits in existing facilities). This distinction allows a proper evaluation of return on capital investment. Divisional executive directors and large-plant managers summarize results for corporate office consumption.

What are the tangible results to date (consumption, emissions, financial, etc.)?
Merck is on target in 2004 to improve its energy cost performance by over four percent. Through 2004, cumulative savings are estimated to be $32 million. Annual savings over each previous year were as follows:

- 2000: $2.8 million
- 2001: $7.7 million
- 2002: $7.2 million
- 2003: $6.7 million
- 2004: $7.2 million (projected)

Total energy expenditures were $115 million in 2000; the total was $178 million in 2004. The increase reflects growth in output. Savings reflect the reduction of energy per unit of production.

Who is the audience for the results?
The primary target for information sharing is Merck's own employees. By sharing this information and increasing awareness, additional savings should be encouraged. Merck also maintains a Corporate Responsibility website that includes energy reduction efforts and progress for external and internal audiences to view. Merck has submitted applications for award consideration and has been honored by The American Chemistry Council for a number of projects. Merck has recently joined the USDOE and USEPA Energy Star program, which may provide another area to share information about energy-reduction efforts.

What are the threats to the durability of the CEM effort, and how are these addressed?
As Merck becomes better at energy-reduction initiatives, it may become increasingly more difficult to find opportunities for savings. Staff interest in energy management should be sustained by implementation of a global program, regular information-sharing sessions, and infusion of new personnel into the team.

In what way have Best Practices and related U.S. Department of Energy resources contributed to energy management?
Merck included a link to the DOE's Website on its intranet energy site, so that individual facilities can take advantage of energy best practices information. Merck's recent corporate-wide partnership with Energy Star should offer more information and resources for personnel. Employee interest is key to achieving Merck's overall energy reduction goals. Employees' recognition of Energy Star concepts, and their awareness of CEO Raymond V. Gilmartin's support for Merck's partnership with Energy Star, should support continuous improvement of energy performance.

A signature project that exemplifies Merck's contribution to energy management through Best Practices applications has been the installation of a fuel cell at the Rahway, NJ facility in 2002. The energy generated by the fuel cell is clean, efficient, and reliable, which supports core business goals.

What remains to be done?
There is always room for improvement. Spurred by initial success, Merck seeks to more fully engage the remainder of the company. Collaboration with Merck's European, Middle Eastern, African and Asian facilities should yield synergistic results.